Concept of Operations

Advanced
Information Technology Services
&
GCCS Leading Edge Services

Increasing conformance to integration environment

R&D → ATD Focus: Advanced Technology Projects → ACTD Focus: Fieldable Prototypes and Conops → AITS-LES → DII, GCCS, GCSS Core

Feedback and availability of existing capabilities

DARPA / DISA JOINT PROGRAM OFFICE

AITS-JPO
PROVIDING LEADING EDGE SERVICES TO THE WARFIGHTER.
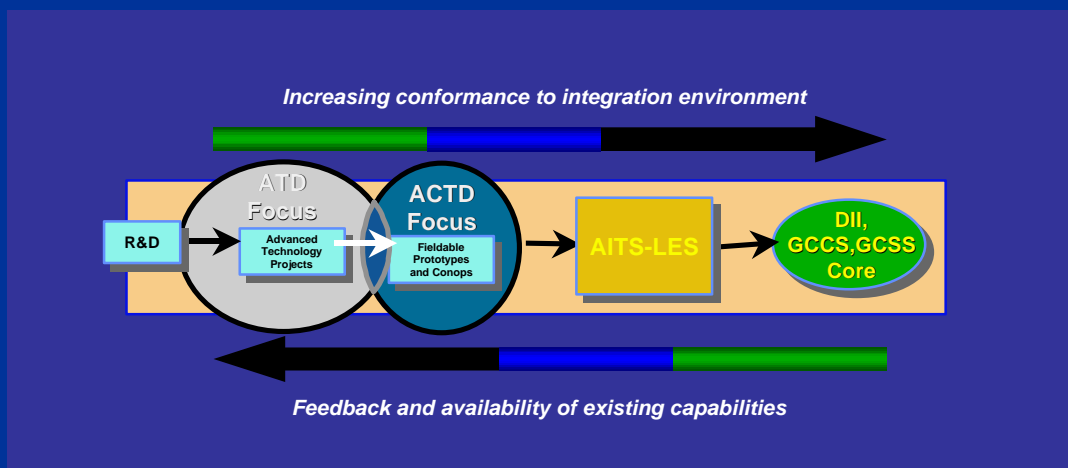
Elements of the AITS-LES Concept

INFORMATION TECHNOLOGY

Rapid Transition to
Supported Production
Systems

Early Deployment
& Support for
Critical Capabilities

Early Evaluation
& Feedback by
the Warfighter
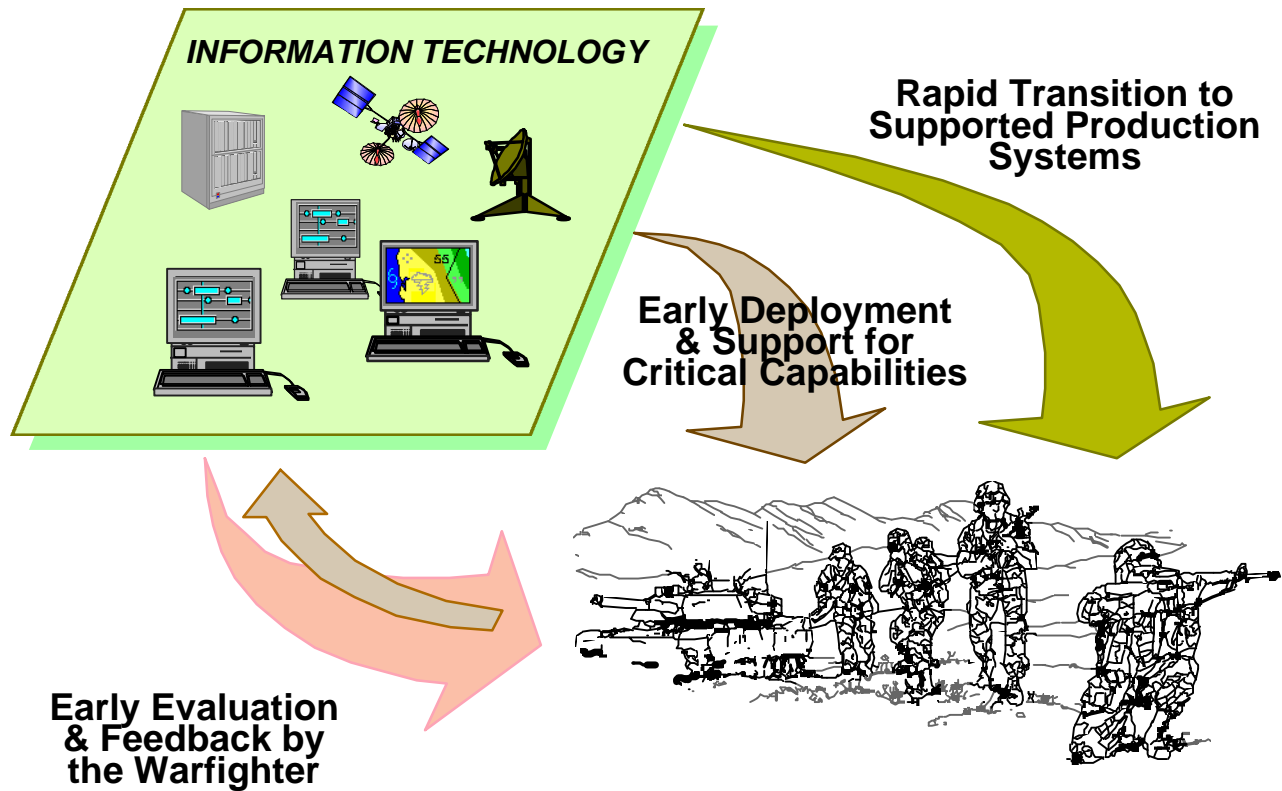
Topics

Phases of Migration from Prototype to Production
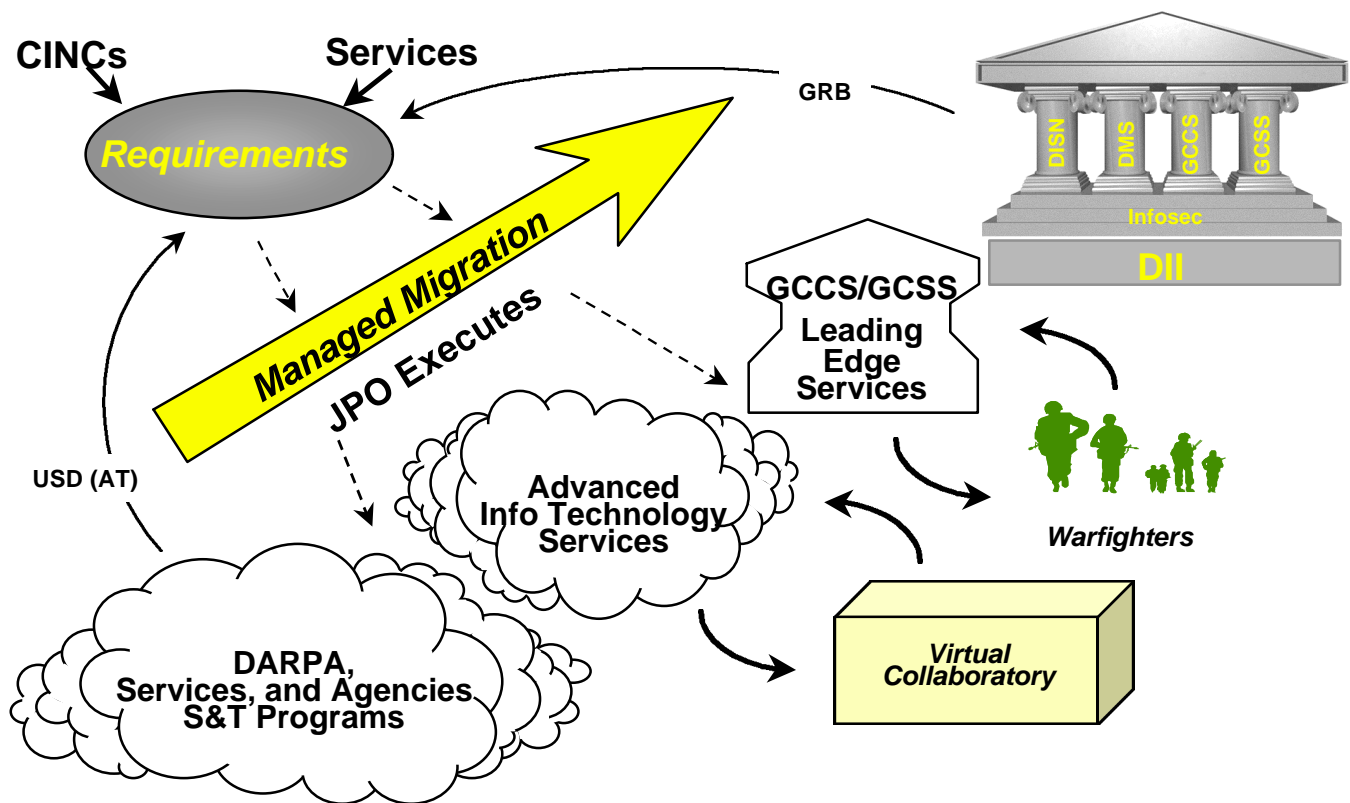
- ## DARPA and Services S&T Programs
  - Focus on functional pieces of the system of systems
  - Conforms to Internal Agency Architectural Guidance

- ## Advanced Information Technology Services
  - Interoperability within the Integration Environment
  - Integrated demonstrations for warfighter feedback
  - Limited operational exposure

- ## Leading Edge Services
  - Compliance to DII Integration & Runtime Specification
  - Segmentation of any supporting components
  - Candidate for transition to DII, GCCS or GCSS (Joint Staff/CINC/Service endorsement, e.g., ACTD)

- ## Production System Transition
  - GCCS Review Board (GRB) Approval for transition
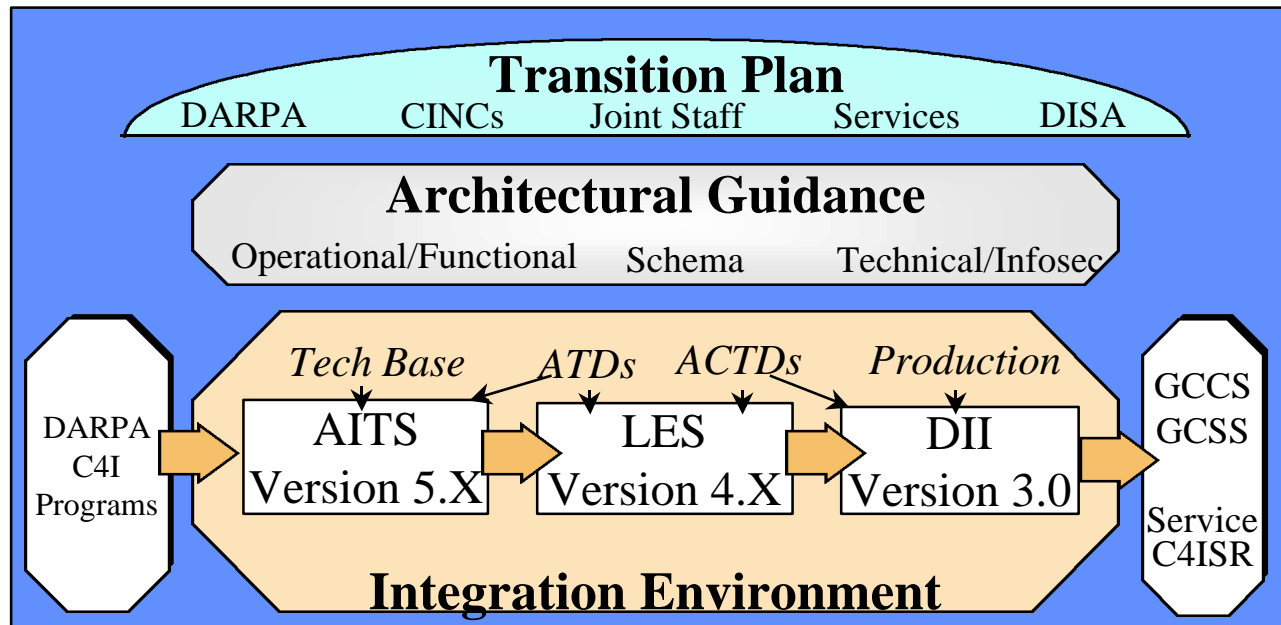 - Sustainment (O&MN after IOC) sponsor identified

Migration of Information Technology into GCCS

Planning for change via a flexible architecture

Migrating applications are mapped into COE development

Integration Process

DII evolution

Version development

Standards, Profiling, Testing, etc

time

DARPA C4I Applications Research

v 2.0   v 3.0   v 4.0   v 5.0

Future DII

DARPA C4I Infrastructure Research

COE and DISN evolve
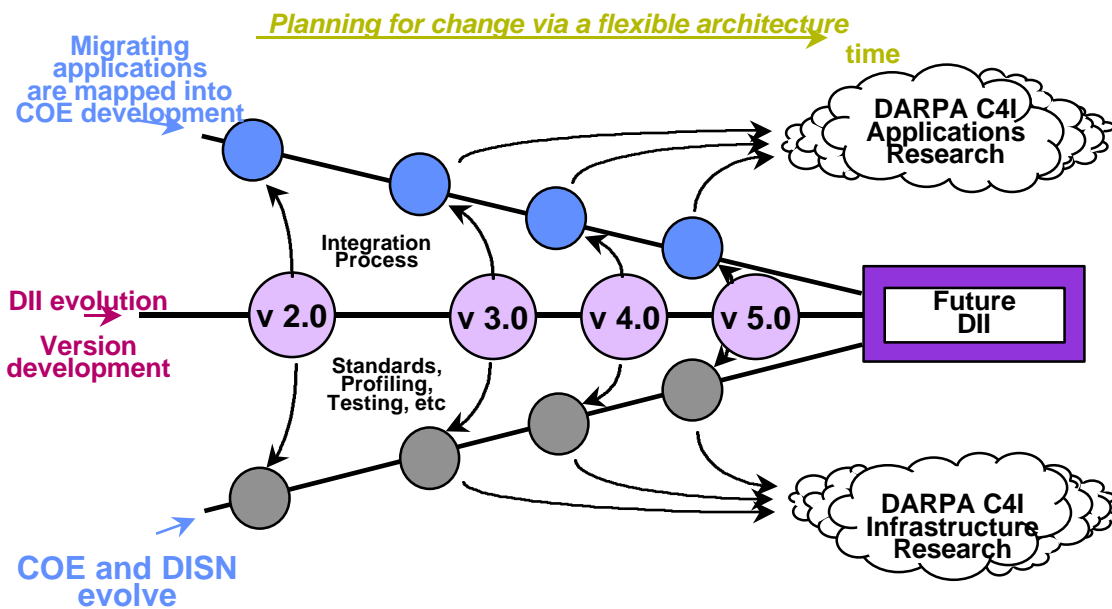
The development philosophy for GCCS, GCSS and the DII is to introduce incremental releases at 6 month intervals, with major "kernel" upgrades every 1 1/2 years

- **GCCS Versions 2.0 and 3.0**
  - Current release of GCCS and its underlying COE is 2.2
  - Version 3.0 will be released to the Warfighter Spring 97
  - The DDJPO is segmenting selected applications from DARPA technology to become part of V3.1 and V3.2
- **GCCS LES Version 4.0**
  - The DDJPO is assembling an environment and set of applications which BUILDS upon GCCS 3.0 and adds advanced information structures and information management to the kernel
  - These will be subjected to evaluation by warfighters and hardening over the next year
  - Hardening will include stable operations, documentation, online training and help-desk support for problems
  - The Chief Engineers for GCCS, GCSS and the DII will select appropriate modules from the LES at the time that the production 4.0 versions are entering development
  - AITS Version 5.0
  - The DDJPO is hosting a set of advanced tools, provided by the DARPA program managers, which will permit development, demonstration and evaluation of advanced architectures and decision support tools
  - These will be available on the LES network for "limited support" demonstrations and exercises.
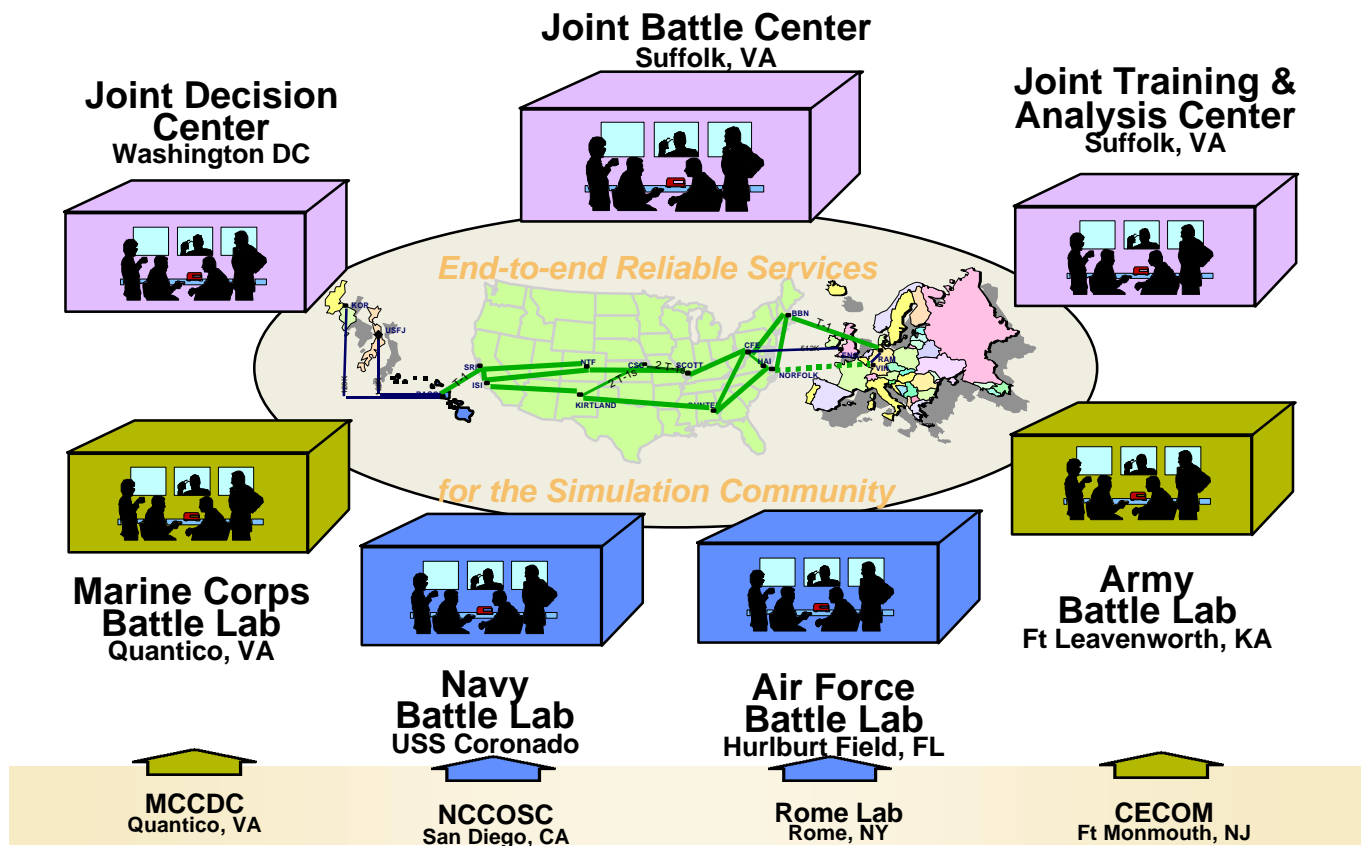
Transition Plan
DARPA   CINCs   Joint Staff   Services   DISA

Architectural Guidance
Operational/Functional   Schema   Technical/Infosec

DARPA C4I Programs → *Tech Base* AITS Version 5.X → *ATDs* *ACTDs* LES Version 4.X → *Production* DII Version 3.0 → GCCS GCSS Service C4ISR

Integration Environment

Overall management of the process rests with a Flag Level review board, consisting of DARPA, DISA and Joint Staff membership. Guidance and services for users consist of:

- **Transition Plan:**
  - Identifies technology components from DARPA technology programs which are eligible for insertion into the AITS-LES pipeline, including commitments of follow-on sponsorship for Sustainment

- **Architectural Guidance:**
  - Operational and functional guidance identifies the interfaces and expected payoffs of integration between DARPA Information Systems programs and components
  - Schema guidance provides configuration management and a shared environment for defining and managing data and objects across programs
  - Technical/Infosec guidance provides a framework of "building codes", tools and procedures for insuring integration and runtime compatibility of federated components

- **Integration Environment:**
  - Provides online versions of Versions 3.X (current DII), 4 (candidate next architecture) and 5 (visionary architecture)
  - Supports developers in integration and demonstration activities and in transition to the selected environment
  - Supports limited deployment of capabilities for evaluation
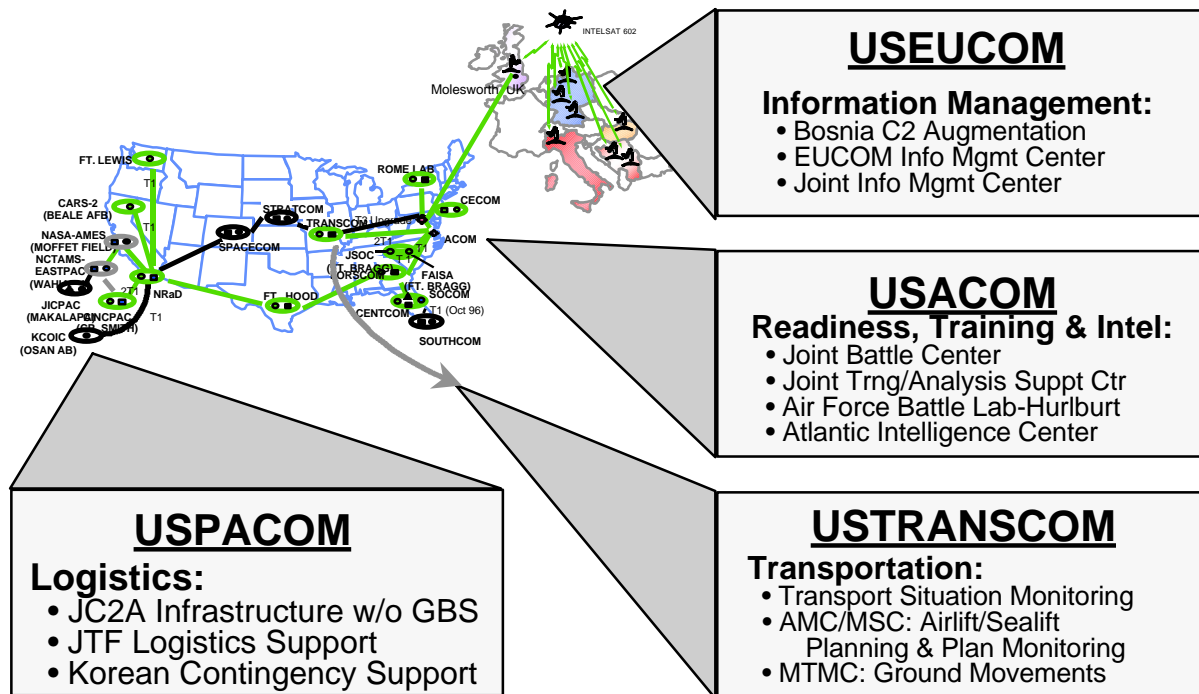 - Process documented in the Integration & Runtime Spec

Early Evaluation and Warfighter Feedback

Joint Battle Center
Suffolk, VA

Joint Decision Center
Washington DC

Joint Training & Analysis Center
Suffolk, VA

End-to-end Reliable Services

for the Simulation Community

Marine Corps Battle Lab
Quantico, VA

Army Battle Lab
Ft Leavenworth, KA

Navy Battle Lab
USS Coronado

Air Force Battle Lab
Hurlburt Field, FL

MCCDC
Quantico, VA

NCCOSC
San Diego, CA

Rome Lab
Rome, NY

CECOM
Ft Monmouth, NJ

- ## Advanced Information Technology Services

  – A development environment which extends from developers and Service R&D Laboratories to the Surrogate Warfighters for ATD and tech base information technology evaluation

  – The Joint Battle Center provides a focal point for evaluating integrated information technology. It is the initial focal node for AITS and LES installation and the primary joint battle node for Joint Warrior Interoperability Demonstrations (JWIDs)

  – ATDs and technology base programs can make their components available on a limited access basis (i.e., short term exposure of fragile applications with onsite technical support)

Critical Capabilities Deployment & Support

USEUCOM

Information Management:
- Bosnia C2 Augmentation
- EUCOM Info Mgmt Center
- Joint Info Mgmt Center

USACOM

Readiness, Training & Intel:
- Joint Battle Center
- Joint Trng/Analysis Suppt Ctr
- Air Force Battle Lab-Hurlburt
- Atlantic Intelligence Center

USPACOM

Logistics:
- JC2A Infrastructure w/o GBS
- JTF Logistics Support
- Korean Contingency Support

USTRANSCOM

Transportation:
- Transport Situation Monitoring
- AMC/MSC: Airlift/Sealift
  Planning & Plan Monitoring
- MTMC: Ground Movements

- # Leading Edge Services

  Online information technology which is more advanced and stable than the AITS. It can be left with warfighters for extended periods, with support such as documentation, training, ILS and trouble desk help

  – DII / DISN LES (including INFOSEC)
  – Global C2 System (GCCS LES)
  – Global Combat Support System (GCSS LES)
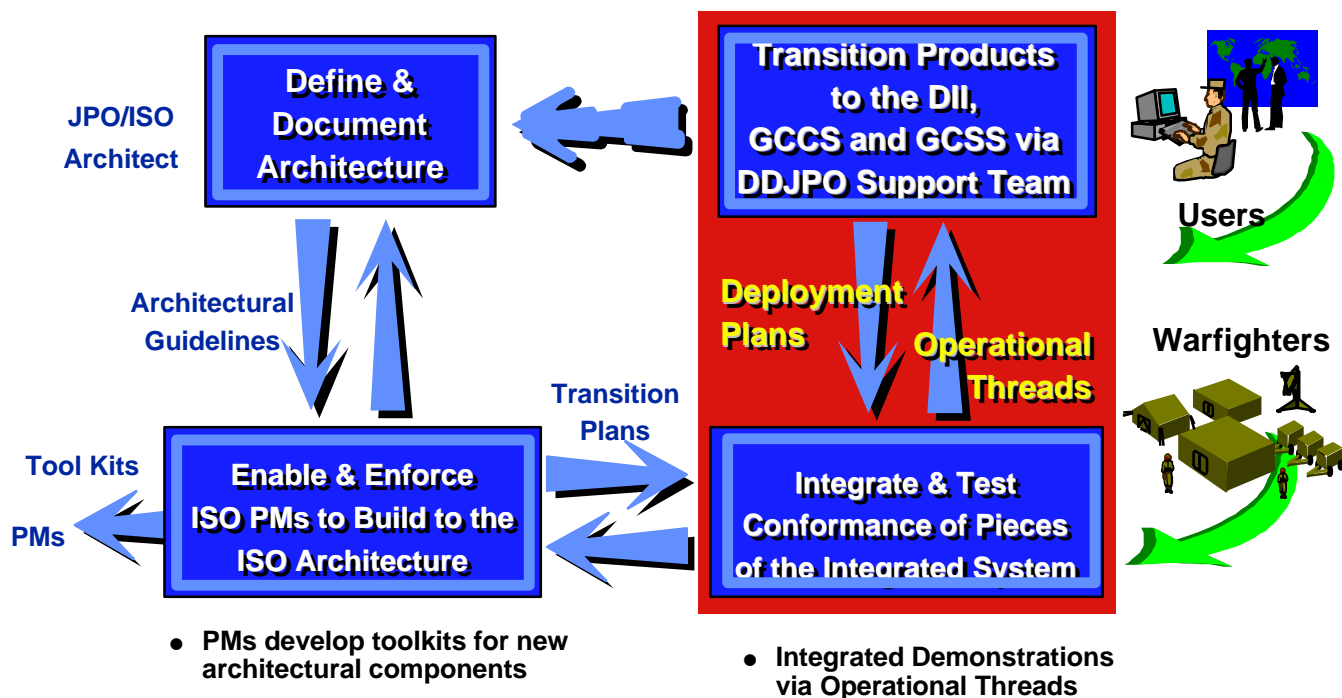 – CONUS Anchor Desk Services

- # LES services are made available to:

  – Developers of ATDs and ACTDs in order to increase the level of integration and speed of transition of technology into the DII by becoming a partner in the advanced DII evolution earlier in the development process
  – Warfighters for "leave-behind" use of technologies on the DII, with access to support in the same manner as for production information systems and networks
  – Selected CINCs will be supported with "beta" LES services depending on their operational focus and unique expertise in C4ISR

Rapid Transition to Production
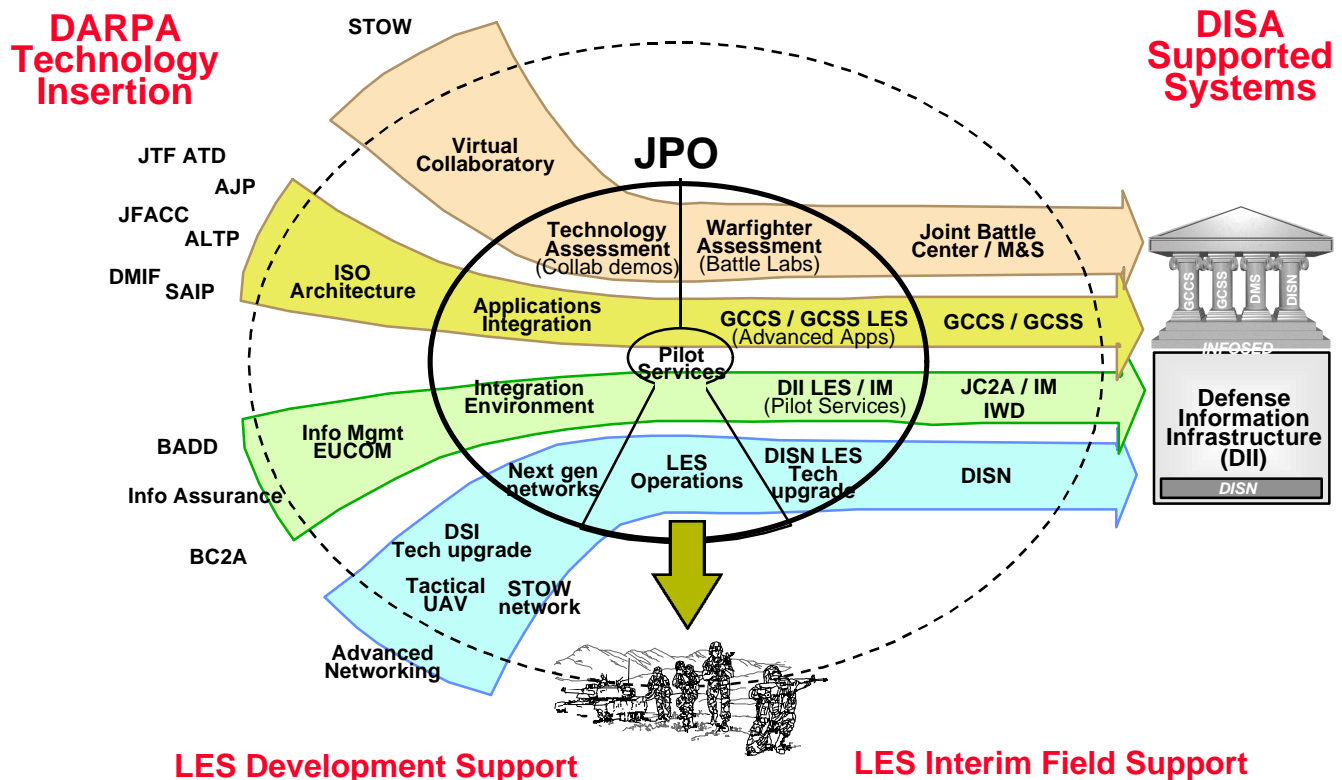
- ## JPO Strategic Thrusts, FY97 and FY98
  - Stand up the Integration Environment to better synergize DARPA program products
  - Advanced Adaptive Networks - infosec, tactical exten-sions and support for bandwidth-adaptive applications
  - DII and Information Management - Capture broadcast Information Management investments and move toward web and object-oriented distributed C4I
  - Advanced C4I and Logistics Applications
  - Support to the Joint Battle Center via the Virtual Collaboratory

- ## Transition consists of:
  - conformance to the LES Integration and Runtime Spec
  - hardening for software stability, scalability, performance, and security
  - achieving levels of COE compliance higher than level 5
  - Demonstrating warfighter payoff to a degree needed to obtain Service/DISA sponsorship for the technology
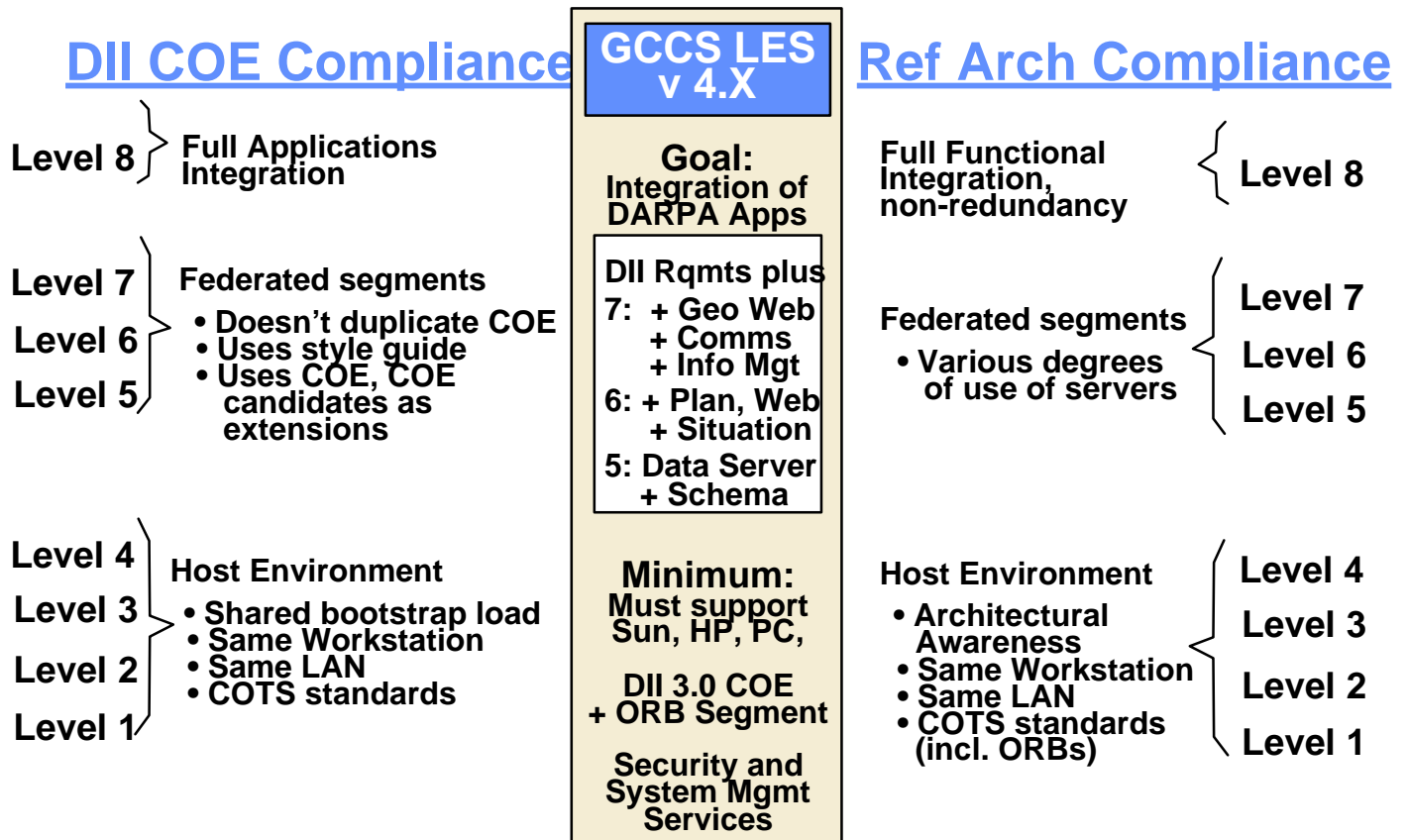
Technology Integration and Transition Process

- PMs develop toolkits for new architectural components
- Integrated Demonstrations via Operational Threads

- ## Architecture
  – DISA D6 maintains the COE architecture for the production system
  – DDJPO maintains the architecture for Version 4 and 5
  – The ISO Architect develops the architecture for Version 5, and enables and enforces its PMs to build the architecture

- ## Integration
 – DDJPO Integrates & Tests pieces of the integrated system, and performs interaction with sponsors to obtain "ownership" from them in the form of deployment and support plans
  – Transition
  – GCCS/Services' C4I systems PMs will select (with help from the Joint Staff) and transition products to the DII
  – As required, the LES pilot services may be called upon to deploy subsets of the DARPA architectural enhancements

Architectural Compliance and Certification

DII COE Compliance

Level 8 — Full Applications Integration

Level 7
Level 6 — Federated segments
- Doesn't duplicate COE
- Uses style guide
- Uses COE, COE candidates as extensions

Level 5

Level 4
Level 3 — Host Environment
Level 2
- Shared bootstrap load
- Same Workstation
- Same LAN
- COTS standards

Level 1

GCCS LES v 4.X

Goal:
Integration of DARPA Apps

DII Rqmts plus
7: + Geo Web
+ Comms
+ Info Mgt
6: + Plan, Web
+ Situation
5: Data Server
+ Schema

Minimum:
Must support Sun, HP, PC,

DII 3.0 COE
+ ORB Segment

Security and System Mgmt Services

Ref Arch Compliance

Full Functional Integration, non-redundancy — **Level 8**

Federated segments
- Various degrees of use of servers

Level 7
Level 6
Level 5

Host Environment
- Architectural Awareness
- Same Workstation
- Same LAN
- COTS standards (incl. ORBs)

Level 4
Level 3
Level 2
Level 1

- The AITS - LES pilot services offer standardized, logical procedures for achieving various levels of integration and compliance to the common operating environment.
- **Levels 1 through 4 focus on hiding machine dependencies.**
  - Levels 5 through 7 focus on various degrees of non-duplicative use of common environment services by federated applications
  - Level 8 focuses on the overall goal of full integration and non-duplication at the applications level
- As shown in the figure, increasing levels of compliance are compared for DII version 3.0 and LES Versions 4.0 and 5.0
- The LES Version 4.0 contains extensions to DII 3.0 to support object-oriented technology and information servers, and the compliance process involves features of both 3.0 and 4.0 components (e.g., both APIs and IDL)
- Details of compliance may be found in the LES Integration and Runtime Specification

Integration, Certification and Transition Facilities
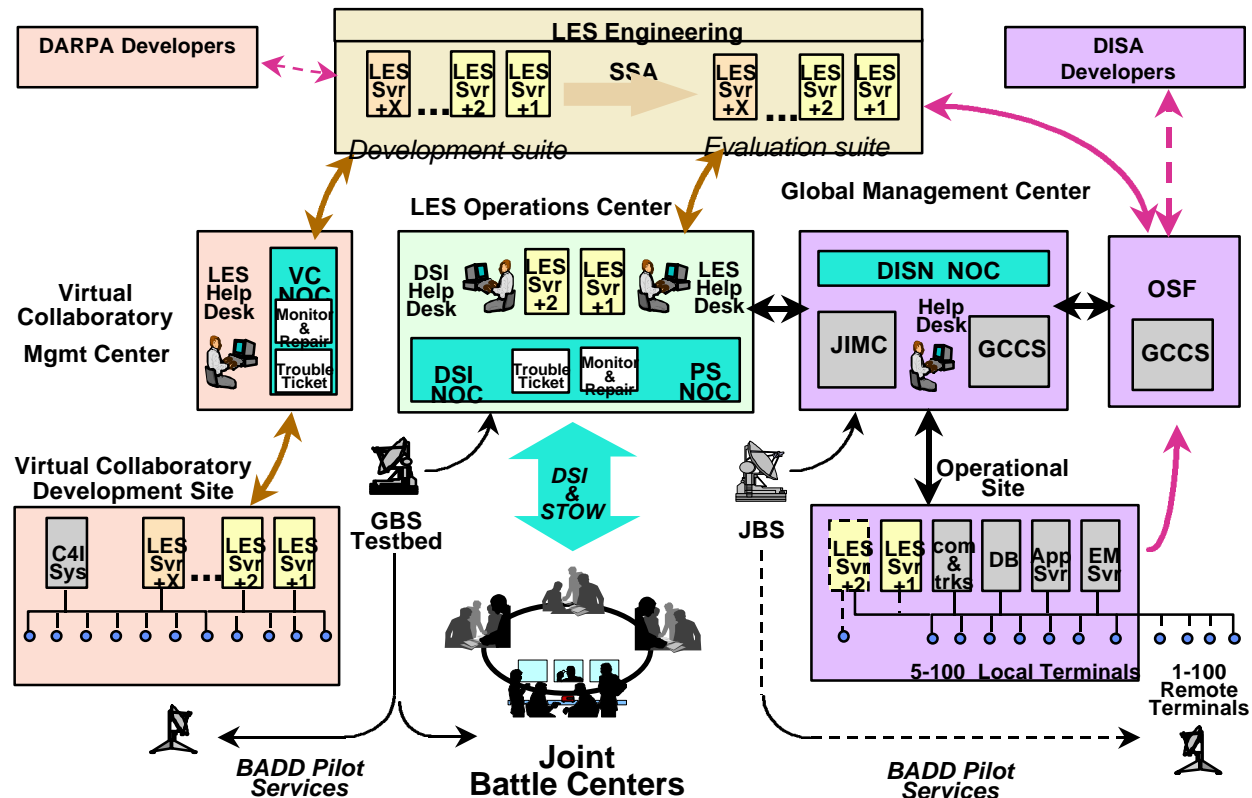
The AITS-LES integration process utilizes the following facilities and associated activities:

- **Deployed LES Installations -** May be at either technology developers' sites or operational commands. The former has access to integration services, and the latter has access to operational support services. Software for operationally deployed LES installations are tested at the OSF and integrated in a manner which makes LES functionality available to GCCS operators at their normal workstations.

- **LES Engineering Facility -** works with DARPA and other technology developers to segment and integrate new components, as well as insuring compliance with the overall architecture. Prime mechanism is the virtual collaboratory environment for developers and the "LES reference node" for operational support.

- **LES Operations Center -** Oversees operations of the LES during warfighter demonstrations (e.g., battle centers) and limited deployments. The operations center interacts with warfighters via the GCCS Management Center, which acts as a central trouble desk for GCCS and GCCS LES support

- **AITS CONUS Anchor Desks -** Provides advanced information services not yet available in production systems. Examples are advanced global broadcast services, information archiving and retrieval, and enhanced common operational picture services

Points of Contact

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